

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

|1-87. canceled.

88. (New) A film which comprises a polyvalent metal salt of a carboxylic acid which is the reaction product of carboxyl groups of a poly(carboxylic acid) polymer (A) with a polyvalent metal compound (B), wherein the poly(carboxylic acid) polymer (A) is a homopolymer or copolymer of at least one α,β -monoethylenically unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, maleic acid, fumaric acid and crotonic acid, or a mixture of at least two polymers thereof, and wherein the film exhibits a peak ratio (A_{1560}/A_{1700}) of a height A_{1560} of an absorption peak at a wave number of 1560 cm^{-1} to a height A_{1700} of an absorption peak at a wave number of 1700 cm^{-1} as determined by infrared absorption spectrum of the film which is at least 0.25.

89. (New) The film according to claim 88, wherein the film is the result of a precursor film comprised of said poly(carboxylic acid) polymer (A) and said polyvalent metal compound (B) having a precursor peak ratio (A_{1560}/A_{1700}) of less than 0.25 being exposed to an atmosphere having a relative humidity of at least 20% for a time sufficient to form the polyvalent metal salt of a carboxylic acid by a reaction of the carboxyl groups of the poly(carboxylic acid) polymer (A) with the polyvalent metal compound (B) to achieve the peak ratio (A_{1560}/A_{1700}) of at least 0.25.

90. (New) The film according to claim 89, wherein the film comprises a film layer formed of a mixture of the poly(carboxylic acid) polymer (A) and the polyvalent metal compound (B).

91. (New) The film according to claim 90, wherein the film layer formed of a mixture of the poly(carboxylic acid) polymer (A) and the polyvalent metal compound (B)

is in a proportion such that a chemical equivalent of the polyvalent metal compound (B) to the carboxyl groups contained in the poly(carboxylic acid) polymer (A) is at least 0.2.

92. (New) The film according to claim 89, wherein the film comprises multiple layers, and wherein one of the layers (a) is formed from the poly(carboxylic acid) polymer (A) and wherein another layer (b) is formed from the polyvalent metal compound (B) and adjoins the layer (a).

93. (New) The film according to claim 92, having a multiple layer structure wherein one layer (a) formed from the poly(carboxylic acid) polymer (A) and another layer (b) formed from the polyvalent metal compound (B) are alternately and adjoiningingly arranged in order of (a)/(b), (b)/(a)/(b) or (a)/(b)/ (a).

94. (New) The film according to claim 92, wherein a chemical equivalent of the total (B_t) of the whole polyvalent metal compound (B) to the total (A_t) of carboxyl groups contained in the poly(carboxylic acid) polymer (A) based on all adjoining layers (a) and (b) is at least 0.2.

95. (New) The film according to claim 88, wherein the poly(carboxylic acid) polymer (A) prior to reaction with the polyvalent metal compound (B) exhibits an oxygen permeation coefficient of at most 1,000 cm³ (STP)·μm / (m² ·day ·MPa) as measured under dry conditions of a temperature of 30°C and a relative humidity of 0%.

96. (New) The film according to claim 88, wherein the polyvalent metal compound (B) is a divalent metal compound.

97. (New) The film according to claim 88, which is soluble in a 1 N aqueous hydrochloric acid solution and/or a 1 N aqueous sodium hydroxide solution.

98. (New) The film according to claim 88, which has a thickness of 0.001 μm to 1 mm.

99. (New) The film according to claim 88, which exhibits an oxygen permeation coefficient of at most $1,000 \text{ cm}^3 (\text{STP}) \cdot \mu\text{m} /(\text{m}^2 \cdot \text{day} \cdot \text{MPa})$ as measured at a temperature of 30°C and a relative humidity of 80%.

100. (New) A packaging material formed from the film according to claim 88.

101. (New) The packaging material according to claim 100, which is in the form of a bag, a sheet, a container or a packaging material for heat sterilization.

102. (New) A laminate comprising a support, and the film according to claim 88 on the support.

103. (New) The laminate according to claim 102, wherein the support is a plastic sheet or film, and wherein the plastic sheet or film is coated on at least one side of the support.

104. (New) A packaging material formed from the laminate according to claim 102.

105. (New) The packaging material according to claim 104, which is in the form of a bag, a sheet, a container or a packaging material for heat sterilization.

106. (New) A precursor film comprising a poly(carboxylic acid) polymer (A), and a polyvalent metal compound (B), wherein the poly(carboxylic acid) polymer is a homopolymer or copolymer of at least one α,β -monoethylenically unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, maleic acid, fumaric acid and crotonic acid, or a mixture of at least two polymers thereof, and wherein the precursor film exhibits a peak ratio (A_{1560}/A_{1700}) of a height A_{1560} of an absorption peak at a wave number of 1560 cm^{-1} to a height A_{1700} of an absorption peak at a wave number of 1700 cm^{-1} as determined by infrared absorption spectrum which is less than 0.25.

107. (New) The precursor film according to claim 106, which comprises a film layer formed of a mixture of the poly(carboxylic acid) polymer (A) and the polyvalent metal compound (B).

108. (New) The precursor film according to claim 107, wherein the film layer formed of a mixture of the poly(carboxylic acid) polymer (A) and the polyvalent metal compound (B) is in a proportion such that a chemical equivalent of the polyvalent metal compound (B) to the carboxyl groups contained in the poly(carboxylic acid) polymer (A) is at least 0.2.

109. (New) The precursor film according to claim 106, wherein the film comprises multiple layers, and wherein one of the layers (a) is formed from the poly(carboxylic acid) polymer (A) and wherein another layer (b) is formed from the polyvalent metal compound (B) and adjoins the layer (a).

110. (New) The precursor film according to claim 109, having a multiple layer structure wherein one layer (a) formed from the poly(carboxylic acid) polymer (A) and another layer (b) formed from the polyvalent metal compound (B) are alternately and adjoiningly arranged in order of (a)/(b), (b)/(a)/(b) or (a)/(b)/(a).

111. (New) The precursor film according to claim 109, wherein a chemical equivalent of the total (Bt) of the whole polyvalent metal compound (B) to the total (At) of carboxyl groups contained in the poly(carboxylic acid) polymer (A) based on all adjoining layers (a) and (b) is at least 0.2.

112. (New) The precursor film according to claim 106, wherein the poly(carboxylic acid) polymer (A) exhibits an oxygen permeation coefficient of at most 1,000 cm³ (STP)·μm / (m² ·day ·MPa) as measured under dry conditions of a temperature of 30°C and a relative humidity of 0%.

113. (New) The precursor film according to claim 106, wherein the polyvalent metal compound (B) is a divalent metal compound.

114. (New) The precursor film according to claim 106, which has a thickness of 0.001 μm to 1 mm.

115. (New) A film which is the result of exposing the precursor film according to claim 106 to an atmosphere having a relative humidity of at least 20% for a time sufficient to form the polyvalent metal salt of a carboxylic acid by reaction of the carboxyl groups of the poly(carboxylic acid) polymer (A) with the polyvalent metal compound (B) thereby resulting in a peak ratio (A₁₅₆₀/A₁₇₀₀) of at least 0.25.

116. (New) A packaging material formed from the precursor film according to claim 106.

117. (New) The packaging material according to claim 116, which is in the form of a bag, a sheet or a container.

118. (New) A laminate comprising a support, and the precursor film according to claim 106 on the support.

119. (New) The laminate according to claim 118, wherein the support is a plastic sheet or film, and wherein the precursor film is coated on at least one side of the support.

120. (New) A packaging material formed from the laminate according to claim 118.

121. (New) The packaging material according to claim 120, which is a bag, a sheet or a container.

122. (New) A process for forming a precursor film comprising forming a film layer which comprises a poly(carboxylic acid) polymer (A), and a polyvalent metal compound (B), wherein the poly(carboxylic acid) polymer is a homopolymer or copolymer of at least one α,β-monoethylenically unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, maleic acid, fumaric acid and

crotonic acid, or a mixture of at least two polymers thereof, and wherein the precursor film exhibits a peak ratio (A_{1560}/A_{1700}) of a height A_{1560} of an absorption peak at a wave number of 1560 cm^{-1} to a height A_{1700} of an absorption peak at a wave number of 1700 cm^{-1} as determined by infrared absorption spectrum which is less than 0.25.

123. (New) The process according to claim 122, which comprises forming the film layer from a mixture of the poly(carboxylic acid) polymer (A) and the polyvalent metal compound (B).

124. (New) The process according to claim 123, wherein forming the film layer from a mixture of the poly(carboxylic acid) polymer (A) and the polyvalent metal compound (B) is practiced such that a chemical equivalent of the polyvalent metal compound (B) to the carboxyl groups contained in the poly(carboxylic acid) polymer (A) is at least 0.2.

125. (New) The process according to claim 122, which comprises forming the film layer of multiple layers, wherein one of the layers (a) is formed from the poly(carboxylic acid) polymer (A) and wherein another layer (b) is formed from the polyvalent metal compound (B) and adjoins the layer (a).

126. (New) The process according to claim 125, wherein said one layer (a) and formed from the poly(carboxylic acid) polymer (A) and said another layer (b) formed from the polyvalent metal compound (B) are alternately and adjoiningly arranged in order of (a)/(b), (b)/(a)/(b) or (a)/(b)/ (a).

127. (New) The process according to claim 125, wherein forming the film layer comprises providing a chemical equivalent of the total (B_t) of the whole polyvalent metal compound (B) to the total (A_t) of carboxyl groups contained in the poly(carboxylic acid) polymer (A) based on all adjoining layers (a) and (b) which is at least 0.2.

128. (New) The process according to claim 122, wherein the poly(carboxylic acid) polymer (A) exhibits an oxygen permeation coefficient of at most $1,000\text{ cm}^3$

(STP)·μm /($m^2 \cdot day \cdot MPa$) as measured under dry conditions of a temperature of 30°C and a relative humidity of 0%.

129. (New) The process according to claim 122, wherein the polyvalent metal compound (B) is a divalent metal compound.

130. (New) The process according to claim 122, which has a thickness of 0.001 μm to 1 mm.

131. (New) A process for forming a film which comprising exposing the precursor film according to claim 122 to an atmosphere having a relative humidity of at least 20% for a time sufficient to form a polyvalent metal salt of a carboxylic acid by reaction of the carboxyl groups of the poly(carboxylic acid) polymer (A) with the polyvalent metal compound (B) thereby resulting in a peak ratio (A_{1560}/A_{1700}) of the film of at least 0.25.

132. (New) A process for forming a film comprising

(1) forming a precursor film layer which comprises a poly(carboxylic acid) polymer (A), and a polyvalent metal compound (B), wherein the poly(carboxylic acid) polymer is a homopolymer or copolymer of at least one α,β-monoethylenically unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, maleic acid, fumaric acid and crotonic acid, or a mixture of at least two polymers thereof, and wherein the precursor film layer exhibits a peak ratio (A_{1560}/A_{1700}) of a height A_{1560} of an absorption peak at a wave number of 1560 cm^{-1} to a height A_{1700} of an absorption peak at a wave number of 1700 cm^{-1} as determined by infrared absorption spectrum which is less than 0.25; and thereafter

(2) exposing the precursor film formed according to step (1) to an atmosphere having a relative humidity of at least 20% for a time sufficient to form a polyvalent metal salt of a carboxylic acid by reaction of the carboxyl groups of the poly(carboxylic acid) polymer (A) with the polyvalent metal compound (B) thereby resulting in a peak ratio (A_{1560}/A_{1700}) of the film of at least 0.25.

133. (New) The process according to claim 132, wherein step (1) comprises forming the precursor film layer from a mixture of the poly(carboxylic acid) polymer (A) and the polyvalent metal compound (B).

134. (New) The process according to claim 133, wherein step (1) is practiced such that a chemical equivalent of the polyvalent metal compound (B) to the carboxyl groups contained in the poly(carboxylic acid) polymer (A) is at least 0.2.

135. (New) The process according to claim 132, wherein step (1) comprises forming the precursor film layer of multiple layers, wherein one of the layers (a) is formed from the poly(carboxylic acid) polymer (A) and wherein another layer (b) is formed from the polyvalent metal compound (B) and adjoins the layer (a).

136. (New) The process according to claim 135, wherein step (1) is practiced such that said one layer (a) formed from the poly(carboxylic acid) polymer (A) and said another layer (b) formed from the polyvalent metal compound (B) are alternately and adjoiningly arranged in order of (a)/(b), (b)/(a)/(b) or (a)/(b)/(a).

137. (New) The process according to claim 135, wherein step (1) is practiced so as to provide a chemical equivalent of the total (B_t) of the whole polyvalent metal compound (B) to the total (A_t) of carboxyl groups contained in the poly(carboxylic acid) polymer (A) based on all adjoining layers (a) and (b) which is at least 0.2.

138. (New) The process according to claim 132, wherein the poly(carboxylic acid) polymer (A) exhibits an oxygen permeation coefficient of at most 1,000 cm³ (STP)·μm / (m² · day · MPa) as measured under dry conditions of a temperature of 30°C and a relative humidity of 0%.

139. (New) The process according to claim 132, wherein the polyvalent metal compound (B) is a divalent metal compound.

140. (New) The process according to claim 132, wherein step (1) is practiced so that the film layer has a thickness of 0.001 μm to 1 mm.